

Claims

What is claimed is:

- 1 1. A forelimb brace device for protecting the fingers, hand, wrist, and forearm
2 of a user from impact injuries, comprising:
 - 3 a proximal support shell;
 - 4 a distal support shell;
 - 5 an MCP joint subassembly that interconnects said proximal support shell
6 and said distal support shell to permit pivotal movement between said proximal
7 support shell and said distal support shell;
 - 8 an adjustable forearm anchoring mechanism integrated in combination with
9 said proximal support shell and adjustable in tension to secure said forelimb
10 brace device against the forearm of the user;
 - 11 an adjustable wrist anchoring mechanism integrated in combination with
12 said proximal support shell and adjustable in tension to secure said forelimb
13 brace device against the wrist of the user; and
 - 14 an adjustable palmar-grip anchoring mechanism integrated in combination
15 with said proximal support shell, said adjustable palmar-grip anchoring
16 mechanism including a palmar grip for positioning the fingers and hand of the
17 user, said adjustable palmar-grip anchoring mechanism being adjustable in
18 tension to secure the hand and wrist in said forelimb brace device;
 - 19 wherein interactive cooperation among said MCP joint subassembly, said
20 adjustable forearm anchor mechanism, said adjustable wrist anchoring
21 mechanism, and said adjustable palmar-grip anchoring mechanism immobilizes
22 the wrist of the user in a predetermined flexion position.
- 1 2. The forelimb brace device of claim 1 further comprising:
 - 2 an inner support layer integrated in combination with the inner surface of
3 said distal support shell.

1 3, The forelimb brace device as in claim 1 or 2 further comprising:
2 an inner support layer integrated in combination with the inner surface of
3 said proximal support shell.

1 4. The forelimb brace device of claim 1 further comprising
2 a finger retention strap integrated in combination with said distal support
3 shell.

1 5. The forelimb brace device of claim 1 wherein said adjustable palmar-grip
2 mechanism comprises:
3 a strap means integrated in combination with said palmar grip; and
4 a ratchet assembly affixed to the dorsal surface of said proximal support
5 shell in a specified orientation with respect to the centerline thereof and
6 integrated in combination with said strap means for movement therebetween;
7 wherein said ratchet assembly is operative to cause movement of said strap
8 means wherein tension is applied to said strap means and said palmar grip in
9 combination therewith.

1 6. The forelimb brace device of claim 5 wherein said strap means is integrated
2 in combination with said proximal support shell by means of a retaining ring; and
3 wherein the specified orientation of said affixed ratchet assembly is diagonal with
4 respect to the centerline of said proximal support shell.

1 7. The forelimb brace device of claim 5 wherein the specified orientation of
2 said affixed ratchet assembly is along the centerline of said proximal support
3 shell.

1 8. The forelimb brace device of claim 1 wherein said MCP joint subassembly
2 further comprises:
3 a proximal stop structure associated with said proximal support shell; and
4 a distal stop structure associated with said distal support shell;

5 wherein abutting engagement between said proximal stop structure and
6 said distal stop structure limits the pivotal movement between said proximal
7 support shell and said distal support shell.

1 9. The forelimb brace device of claim 1 wherein said adjustable forearm
2 anchoring mechanism comprises:
3 a retaining ring affixed to one lateral surface of said proximal support shell;
4 and
5 a Velcro strap having one end thereof affixed to the other lateral surface of
6 said proximal support surface;
7 wherein said Velcro strap is integrated in combination with said retaining
8 ring such that the other end thereof can be manipulated by the user to apply
9 tension to said Velcro strap to secure said forelimb brace device against the
10 forearm of the user.

1 10. The forelimb brace device of claim 1 wherein said adjustable forearm
2 anchoring mechanism comprises:
3 a buckle integrated in combination with one lateral surface of said proximal
4 support shell; and
5 a belt means affixed to the other lateral surface of said proximal support
6 shell;
7 wherein said belt means and said buckle are integrated in combination by
8 the user to apply tension to said belt means to secure said forelimb brace device
9 against the forearm of the user.

1 11. The forelimb brace device of claim 1 wherein said adjustable forearm
2 anchoring mechanism comprises:
3 a ratchet buckle integrated in combination with one lateral surface of said
4 proximal support shell; and

5 a strap means having one end thereof affixed to the other lateral surface of
6 said proximal support means and the other end thereof integrated in combination
7 with said ratchet buckle;

8 wherein said ratchet buckle is operative to cause movement of said strap
9 means wherein tension is applied to said strap means to secure said forelimb
10 brace device against the forearm of the user.

1 12. The forelimb brace device of claim 1 wherein said adjustable wrist
2 anchoring mechanism comprises:

3 a retaining ring affixed to one lateral surface of said proximal support shell;
4 and

5 a Velcro strap having one end thereof affixed to the other lateral surface of
6 said proximal support surface;

7 wherein said Velcro strap is integrated in combination with said retaining
8 ring such that the other end thereof can be manipulated by the user to apply
9 tension to said Velcro strap to secure said forelimb brace device against the wrist
10 of the user.

1 13. The forelimb brace device of claim 1 wherein said adjustable wrist
2 anchoring mechanism comprises:

3 a buckle integrated in combination with one lateral surface of said proximal
4 support shell; and

5 a belt means affixed to the other lateral surface of said proximal support
6 shell;

7 wherein said belt means and said buckle are integrated in combination by
8 the user to apply tension to said belt means to secure said forelimb brace device
9 against the wrist of the user.

1 14. The forelimb brace device of claim 1 wherein said adjustable wrist
2 anchoring mechanism comprises:

3 a ratchet buckle integrated in combination with one lateral surface of said
4 proximal support shell; and
5 a strap means having one end thereof affixed to the other lateral surface of
6 said proximal support means and the other end thereof integrated in combination
7 with said ratchet buckle;
8 wherein said ratchet buckle is operative to cause movement of said strap
9 means wherein tension is applied to said strap means to secure said forelimb
10 brace device against the wrist of the user.

1 15. The forelimb brace device of claim 1 wherein said MCP joint subassembly
2 for interconnecting said proximal support shell and said distal support shell
3 comprises:
4 spaced-apart proximal joint housings associated with said proximal support
5 shell;
6 spaced-apart distal joint housings associated with said distal support shell,
7 said spaced-apart distal joint housings corresponding in number and opposed
8 relation to said spaced-apart proximal joint housings; and
9 a resilient member integrated in combination with opposed ones of said
10 spaced-apart proximal and distal joint housings;
11 wherein said resilient members facilitate pivotal movement between said
12 proximal support shell and said distal support shell.